Pressure Vessel Inspection Report – *DRAFT REPORT*

In accordance with API 510

ERG

Vessel NATX-32000

External Inspection

Othello, WA

June 21, 2017 to June 21, 2017

Report Number 40373514

Prepared By:
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MISTRAS Services Division
A World of NDT Solutions

Inspection Date
June 21, 2017

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5.0 Ultrasonic Thickness Data

5.1 Shell Plate UT

The following table details all readings (in) from the shell UT survey. All scan profiles were equally spaced at 2 ft. Progression is from south shell-to-head girth weld to the north shell-to-head girth weld in 2' horizontal increments. Positions are top, east, bottom and west.

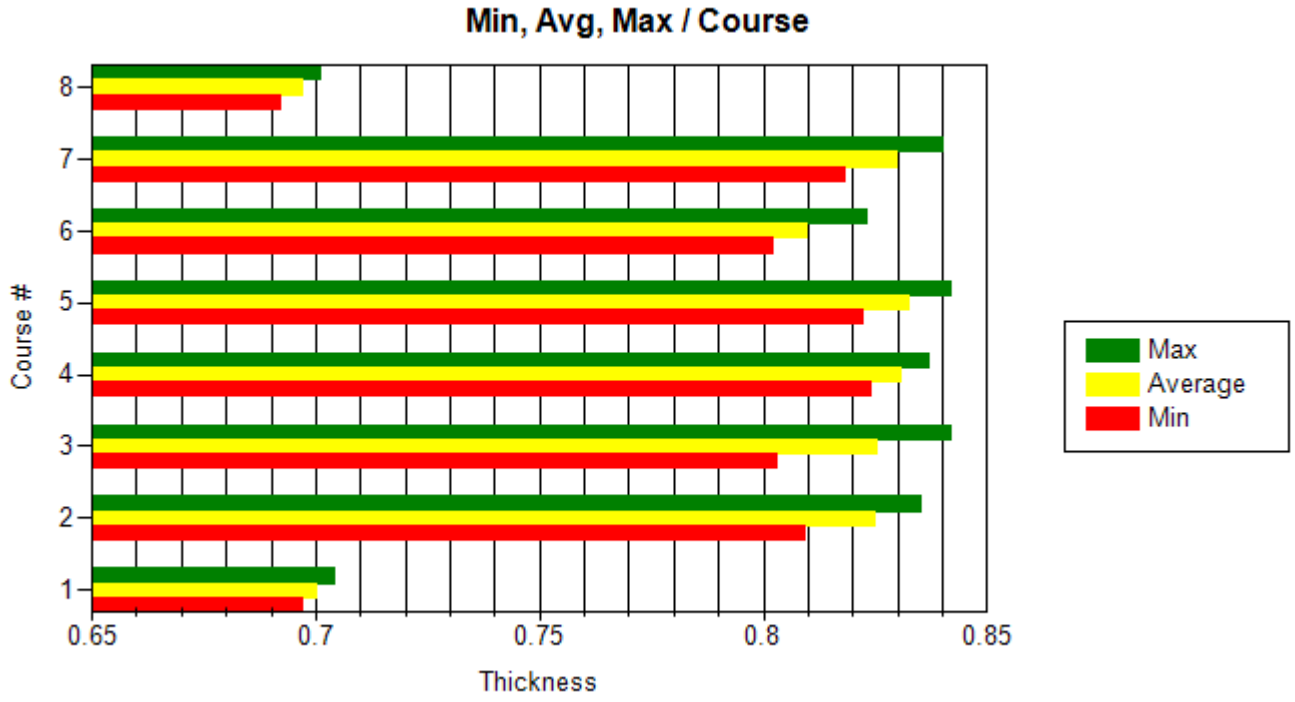
Data and Statistics		1	2	3	4	*Readings Line Average*
Course 8 (Small dia shell section)	**T**	0.698	0.701	0.698	N/A	0.699
	E	0.696	0.698	0.696	N/A	0.697
	B	0.696	0.699	0.696	N/A	0.697
	W	0.692	0.697	0.696	N/A	0.695
Course 7 (Eccentric Cone section)	**T**	0.826	0.830	0.829	0.829	0.828
	E	0.837	0.834	0.840	0.832	0.836
	B	0.825	0.826	0.828	0.829	0.827
	W	0.826	0.818	0.831	0.834	0.827
Course 6	**T**	0.804	0.805	0.806	0.802	0.804
	E	0.822	0.805	0.802	0.802	0.808
	B	0.807	0.811	0.813	0.808	0.810
	W	0.819	0.823	0.806	0.822	0.818
Course 5	**T**	0.839	0.840	0.842	0.835	0.839
	E	0.834	0.837	0.825	0.829	0.831
	B	0.836	0.829	0.839	0.827	0.833
	W	0.829	0.830	0.825	0.822	0.826
Course 4	**T**	0.830	0.837	0.835	0.825	0.832
	E	0.827	0.833	0.830	0.824	0.829
	B	0.826	0.836	0.836	0.824	0.831
	W	0.829	0.836	0.834	0.830	0.832
Course 3	**T**	0.818	0.829	0.830	0.814	0.823
	E	0.837	0.832	0.831	0.814	0.829
	B	0.840	0.841	0.842	0.831	0.838
	W	0.810	0.816	0.815	0.803	0.811
Course 2 (Eccentric Cone Section)	**T**	0.827	0.823	0.824	0.819	0.823
	E	0.830	0.831	0.832	0.830	0.831
	B	0.814	0.812	0.811	0.809	0.811
	W	0.832	0.834	0.835	0.834	0.834
Course 1 (Small dia	**T**	0.698	0.702	0.697	N/A	0.699
	E	0.698	0.699	0.699	N/A	0.699

shell section)	**B**	0.699	0.700	0.703	N/A	0.701
	W	0.701	0.704	0.701	N/A	0.702
Scan Line Average		0.794	0.795	0.795	0.822	0.800

The tables below present the statistics of the thickness readings (in) obtained on the Shell plates.

Course #	Min	Avg	Max
8	0.692	0.697	0.701
7	0.818	0.830	0.840
6	0.802	0.810	0.823
5	0.822	0.832	0.842
4	0.824	0.831	0.837
3	0.803	0.825	0.842
2	0.809	0.825	0.835
1	0.697	0.700	0.704
Global	0.692	0.800	0.842

The following chart depicts the average thickness reading (in) on the shell in correlation with the course number.



5.2 North Head UT

The following table details all readings (in) obtained on the North Head. Readings were acquired in a cross like pattern from top to bottom (Row 1) and left to right (Row 2).

Plate ID \ Reading ID	1	2	3	4	5	6	7	8	9	10	11	*Avg*
Row 1	0.698	0.697	0.695	0.696	0.698	0.697	0.698	0.692	0.691	0.695	0.695	0.696
Row 2	0.688	0.689	0.692	0.695	0.693	0.697	0.695	0.698	0.699	0.697	0.700	0.695
Avg	0.693	0.693	0.693	0.695	0.696	0.697	0.697	0.695	0.695	0.696	0.697	0.695

The table below presents the statistics of the thickness readings obtained on the head.

UT Summary	
Maximum	0.700
Average	0.695
Minimum	0.688

5.3 South Head UT

The following table details all readings (in) obtained on the South Head. Readings were acquired in a cross like pattern from top to bottom (Row 1) and left to right (Row 2).

Plate ID \ Reading ID	1	2	3	4	5	6	7	8	9	10	11	*Avg*
Row 1	0.678	0.680	0.680	0.684	0.682	0.680	0.683	0.676	0.681	0.681	0.679	0.680
Row 2	0.681	0.692	0.695	0.687	0.686	0.680	0.684	0.680	0.681	0.680	0.676	0.684
Avg	0.679	0.686	0.688	0.685	0.684	0.680	0.684	0.678	0.681	0.681	0.678	0.682

The table below presents the statistics of the thickness readings obtained on the head.

UT Summary	
Maximum	0.695
Average	0.682
Minimum	0.676

5.4 Shell Nozzle & Connection Table

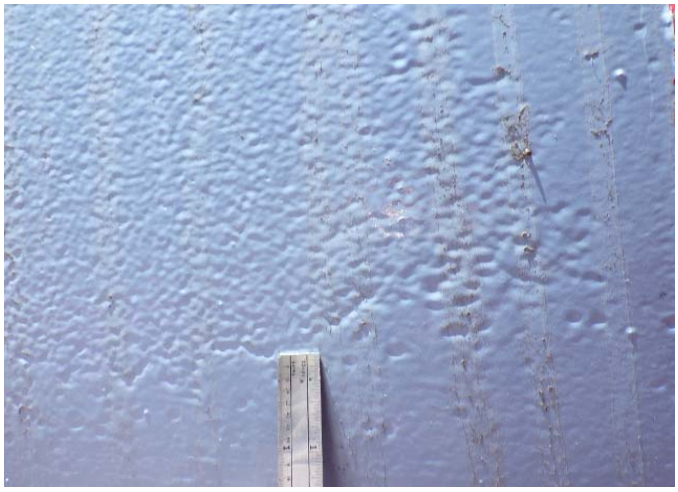
Item	Type	Service	Pipe Size (in)	Station (ft)	Center Line Elevation (ft)	API Allowable Elevation (ft)	Repad Width (in)	Repad Height (in)	Tell Tale Hole	Repad Shape	Weld Spacing (in)	Distance From Shell to Flange Face (in)
A	Manway	Internal Access	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

5.5 Shell Nozzle UT

Item	Type	Service	Pipe Size (in)	North (in)	East (in)	South (in)	West (in)	Repad Thickness (in)	Flange Thickness (in)	Cover Thickness (in)	Comments
A	Manway	Internal Access	N/A	1.057	N/A	N/A	N/A	N/A	N/A	N/A	Limited Access Due to Grating

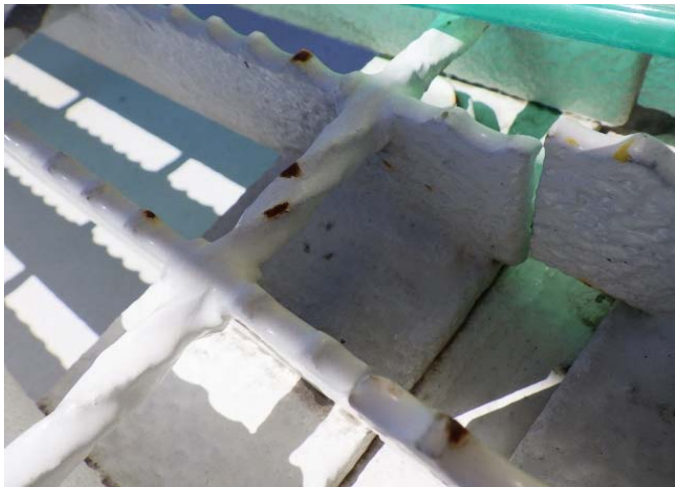
7.0 Photographs

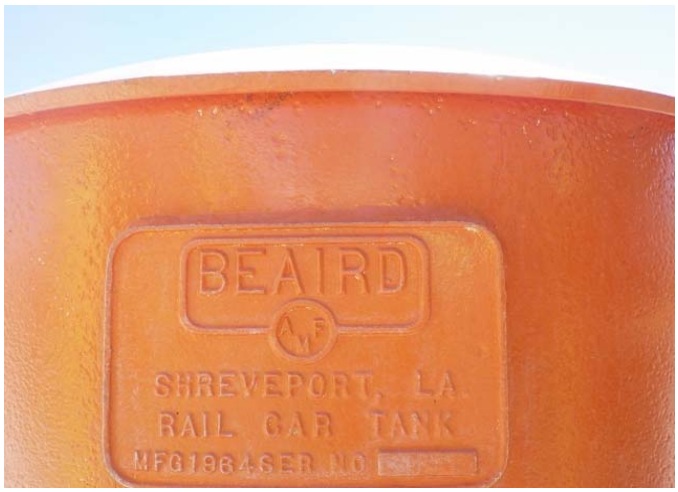
Tank Car East Overview	South Head Overview
	
Tank Car West Overview	North Head Overview
	
Capacity Stencil	Original Data Stampings on South Head
	

Original Data Stampings on North Head	View of Underside of Shell
	
Sadde Support Configuration Typical	Wheel Assembly Typical
	
Coating Failure on Grating Support Frame South	Prior Active Corrosion
	

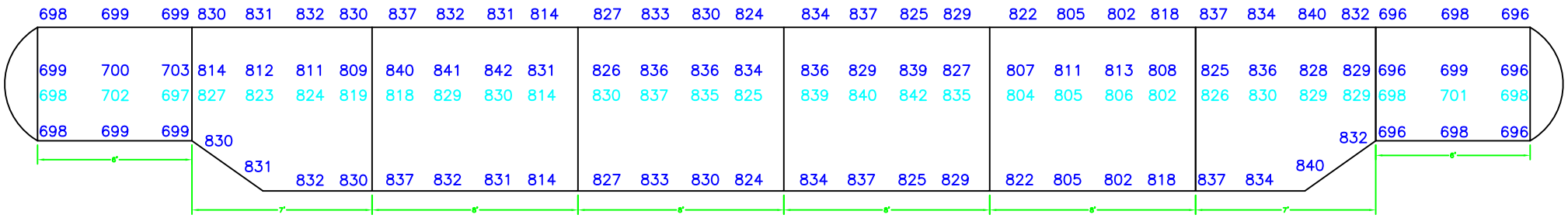
Coating Failure North Head	Shell Coating Failure Typical
	
Prior Pitting on North Head	Mechanical Scrape on North Head
	
Old Shell Attachments	Mechanical Scrap in Shell
	

North Head Step Grating	Prior Corrosion on South Head
	
Drop Down Platform & Safety Chains	Top Access Point Stairs
	
Coating Wear at Platform Contact Point	Top Walkway Overview
	

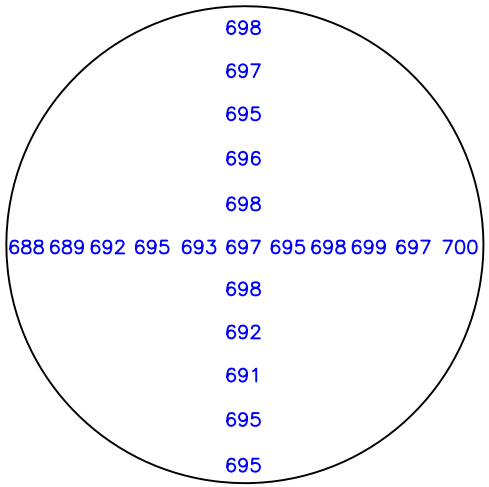
Walkway Structure Attachment Points	Coating Failures on Grating Typical
	
Coating Failure at Flat Bar Surface Juncture	Manway A Cover Detail
	
Manway Platform Upright Corrosion	Coating Failure on Handrail Upright Angles
	

Broken Grating Hold Down Bar	Platform Angle to Grating Interface
	
Coating Deterioration on Manway Repad	Manway Cover Original Stampings
	

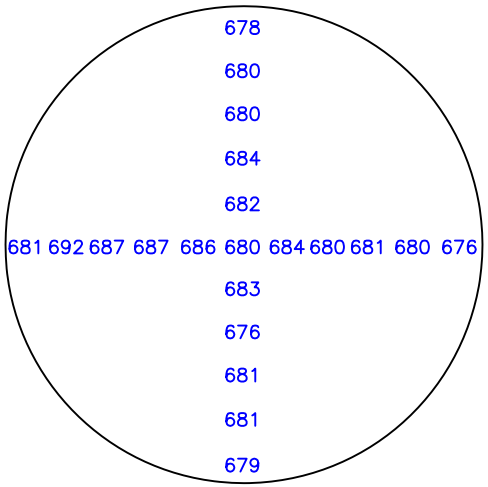
EXTERNAL RAIL CAR VIEW EAST PROFILE



NORTH HEAD



SOUTH HEAD



LEGEND & NOTES

XXX WEST SIDE UT LOCATIONS

CUSTOMER: ERG/MULTISTAR	SHELL LENGTH: 62' DIAMETER: 10' to 8.6'	INSPECTION DATE: 06/21/2017	MISTRAS SERVICES
LOCATION: OTHELLO, WA	INSPECTOR: ZACH LIBBY	DRAWING NUMBER: NATX32000-Shell	7820 S 210th Street, Building C, Suite 110 Kent, WA 98032
TANK NUMBER: NATX-32000	TECHNICIAN: BOBBY HOGAN	CAD DRAFTSMAN: BOBBY HOGAN	